

FIG. 48

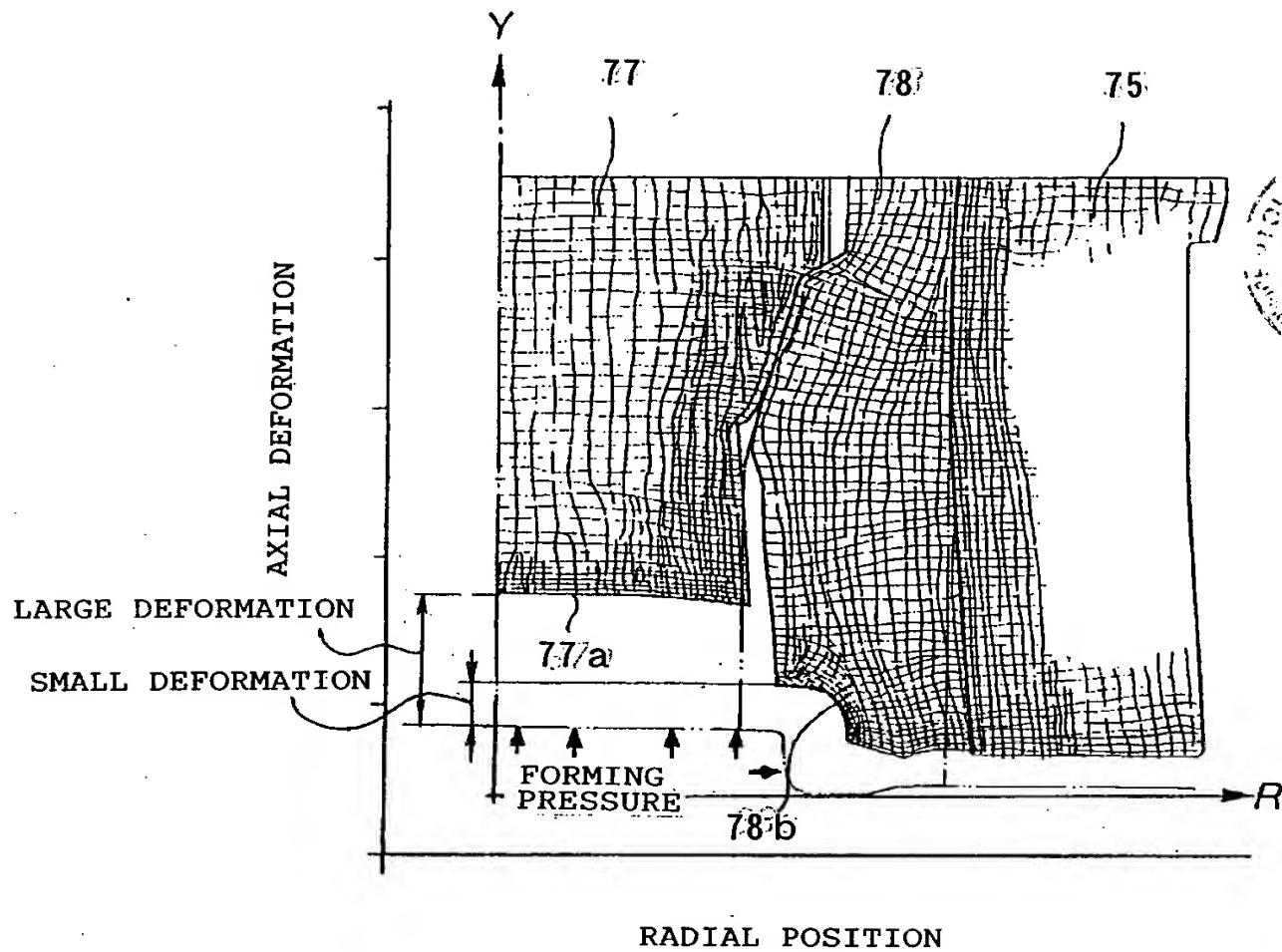
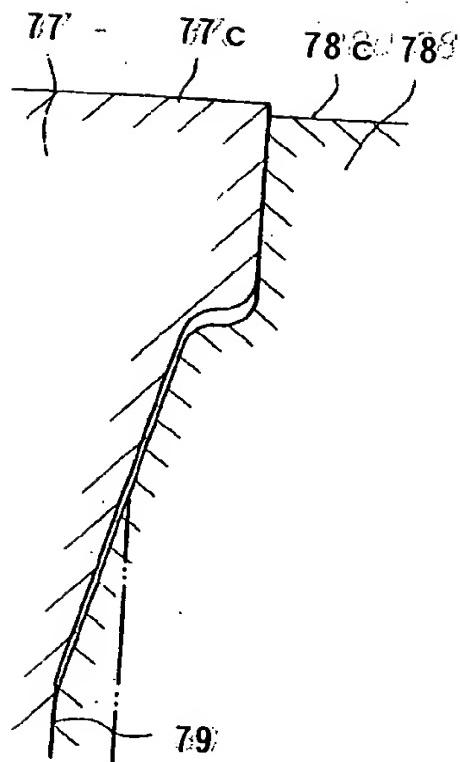


FIG. 46



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FIG. 47

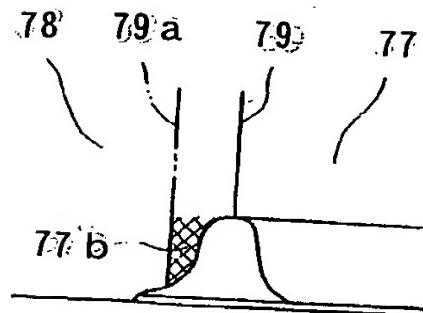


FIG. 44

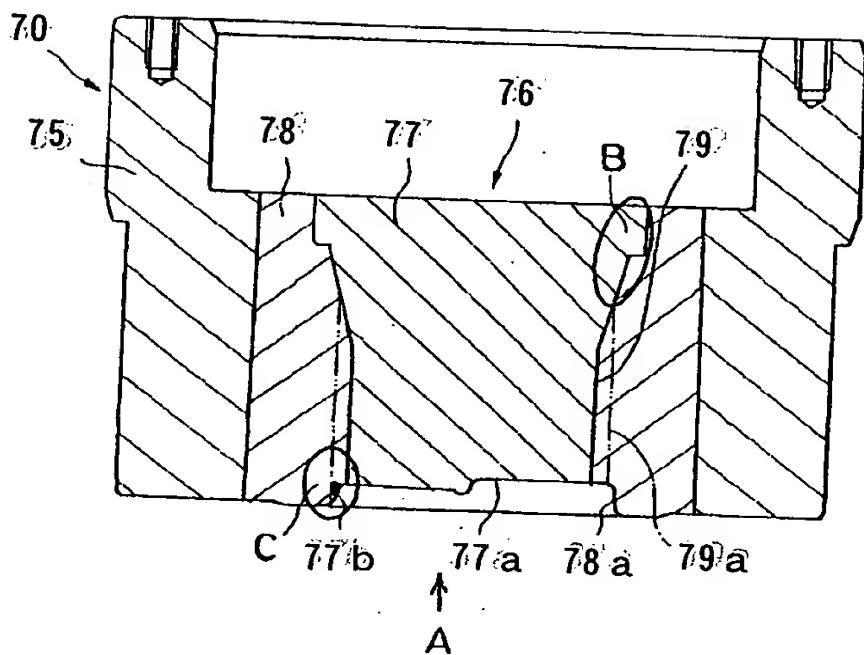


FIG. 45

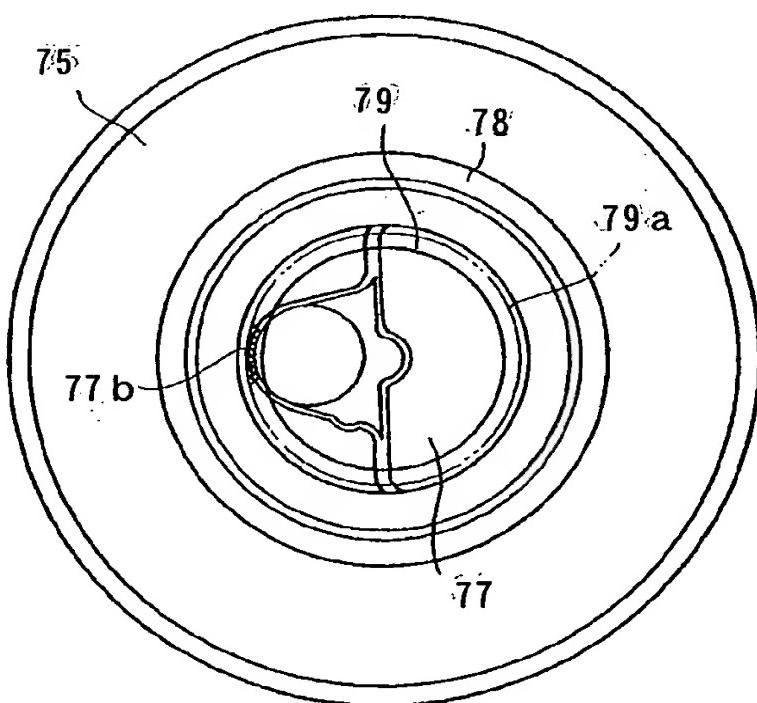




FIG. 43

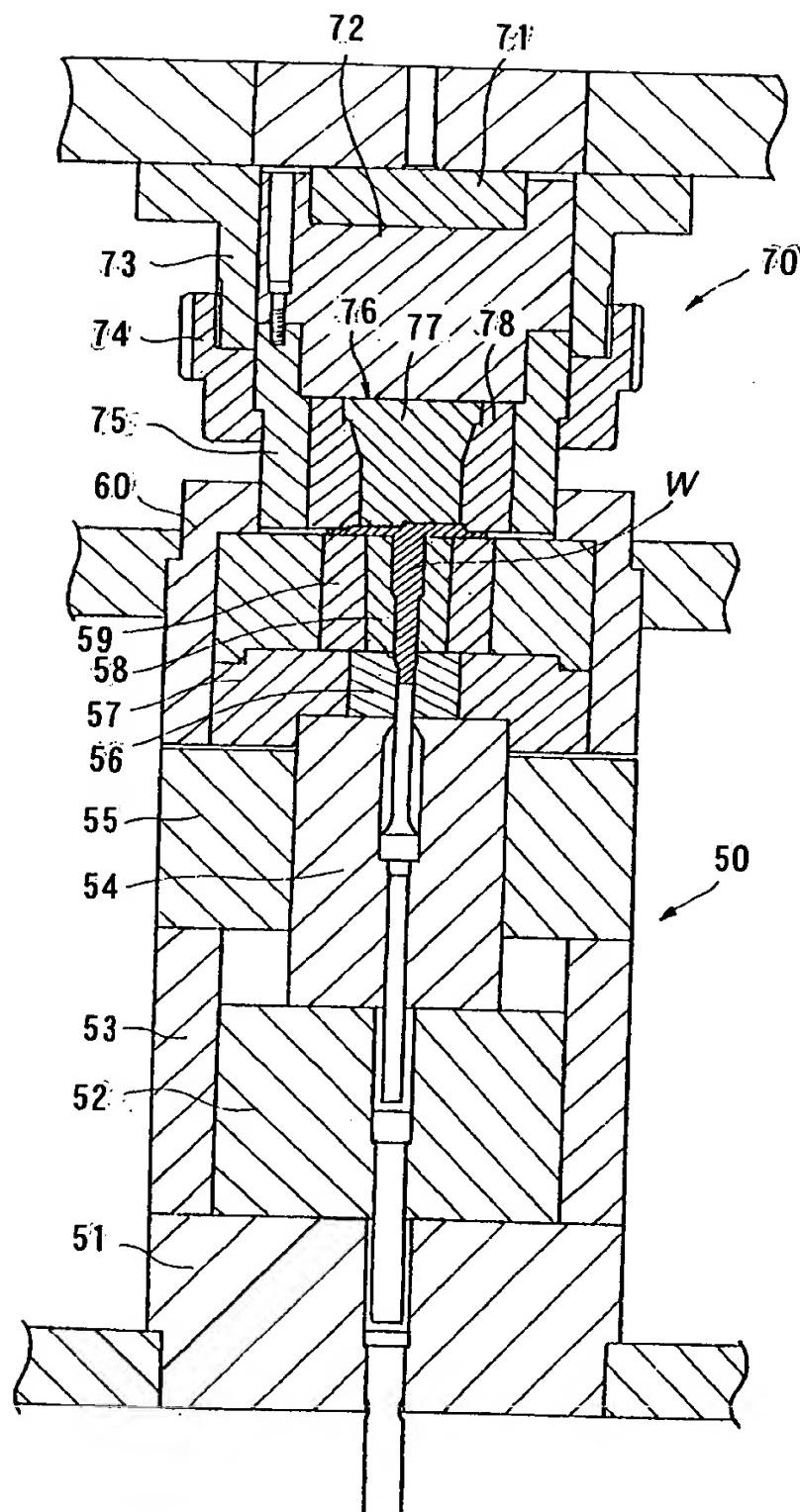
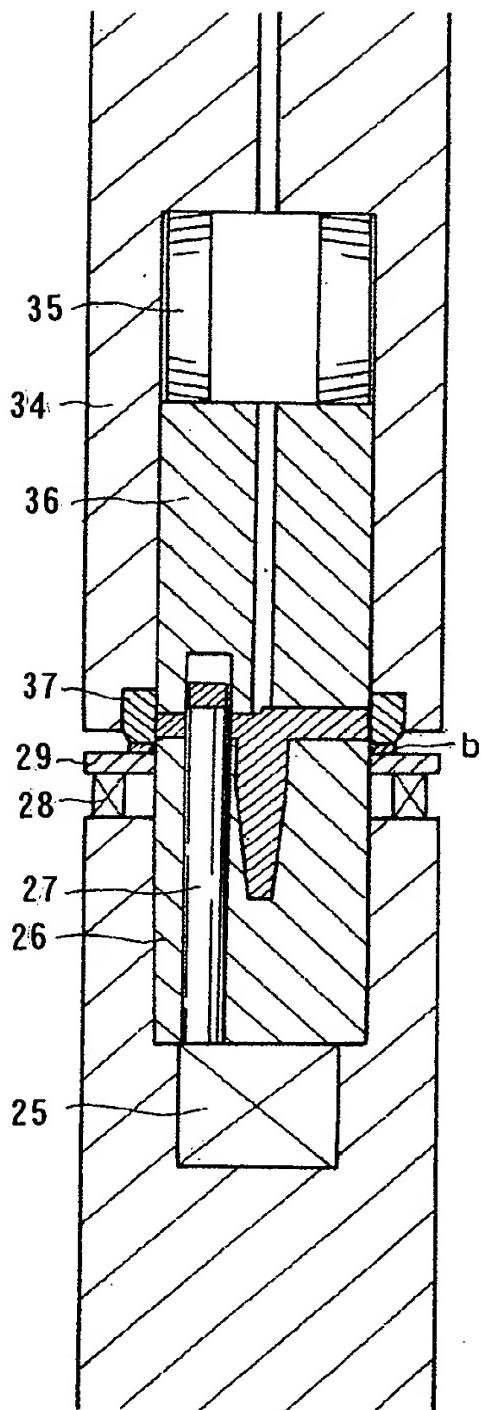
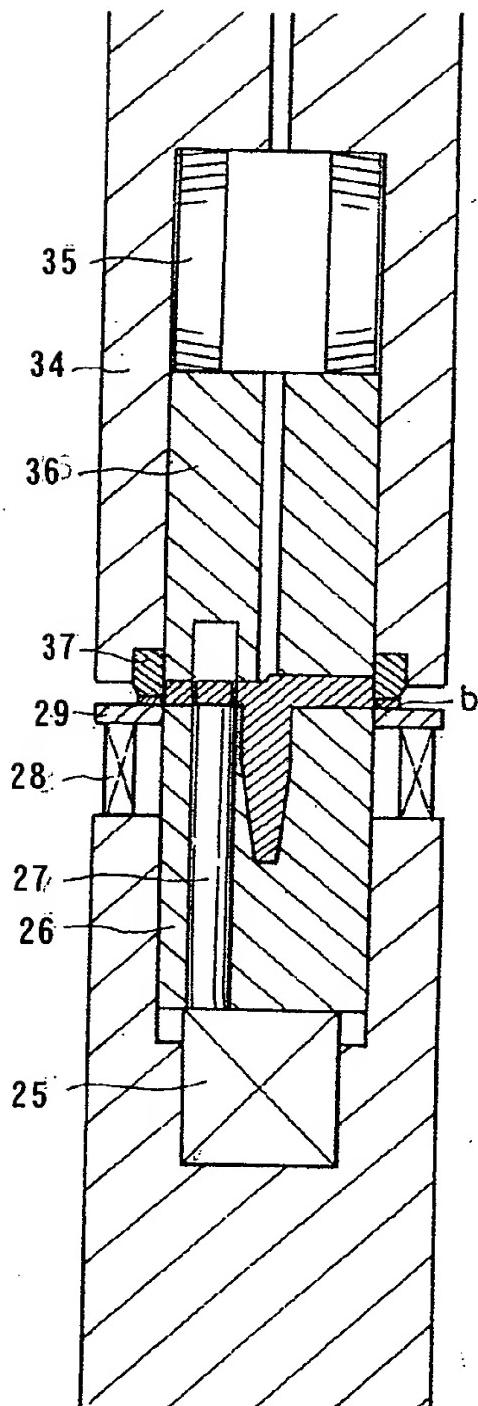


FIG. 42



(a)



(b)

FIG. 41

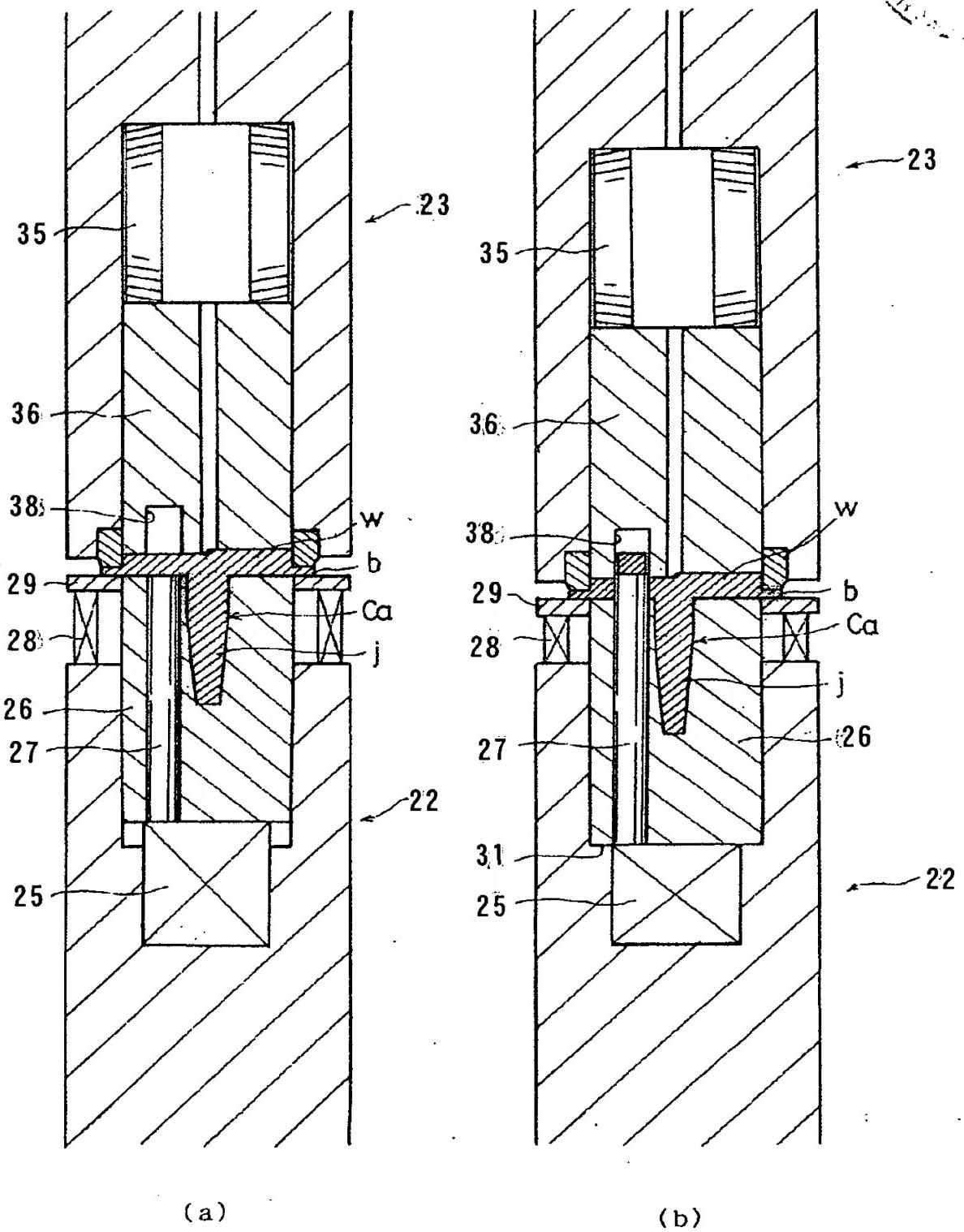


FIG. 40

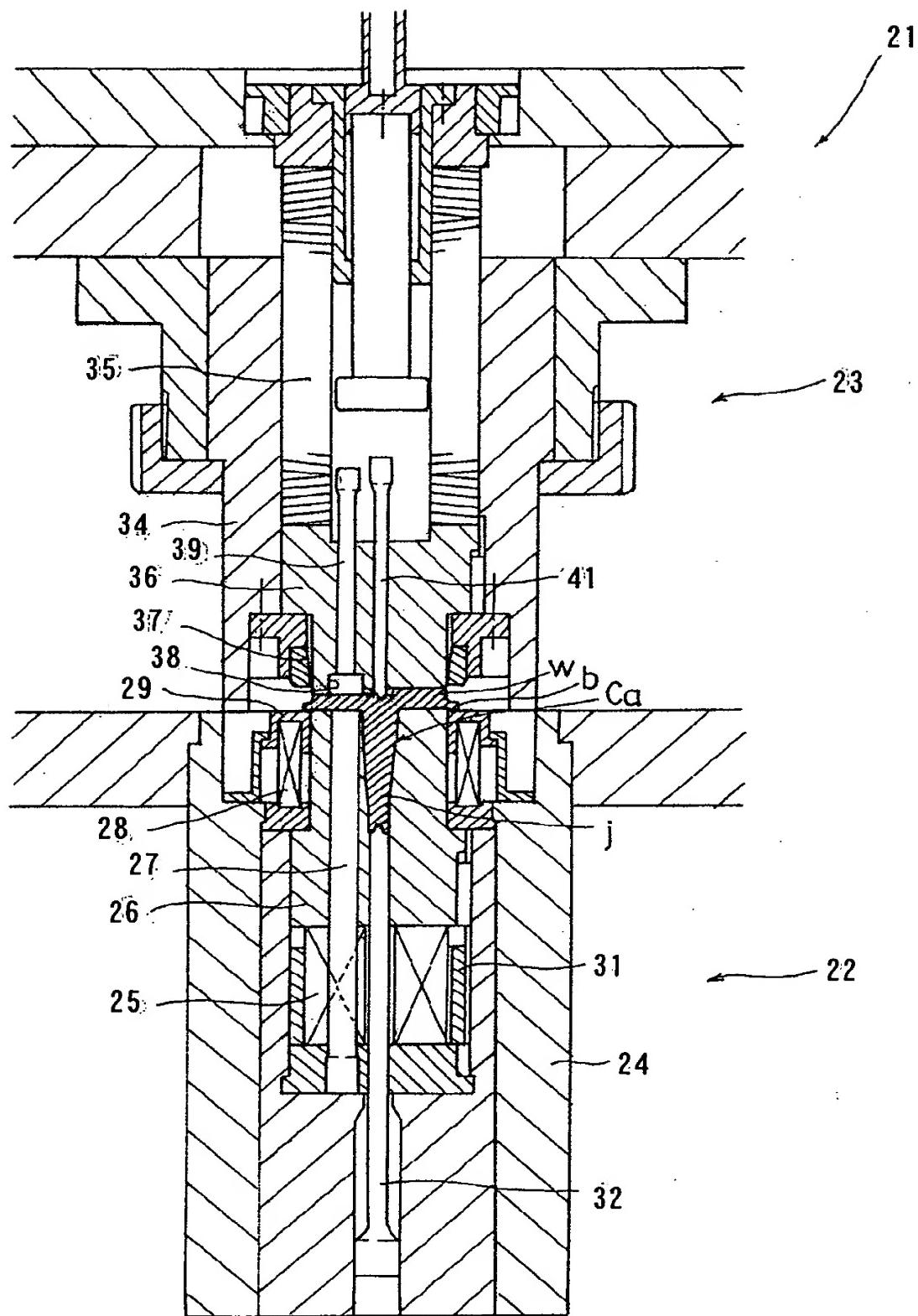


FIG. 39



FIG. 38

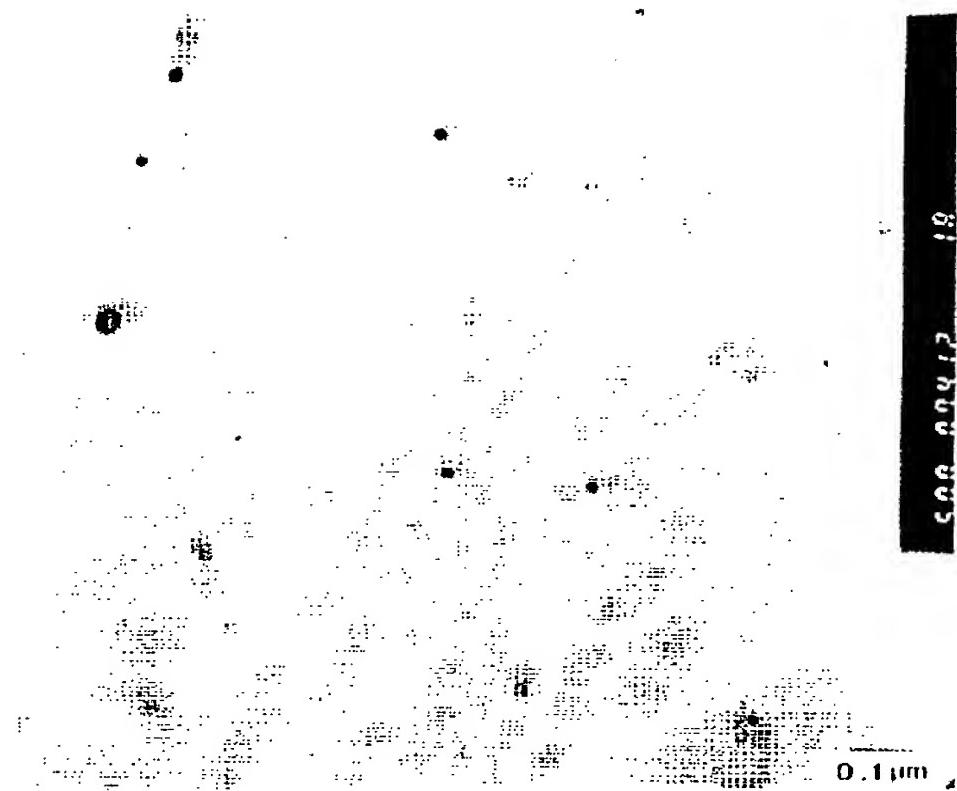
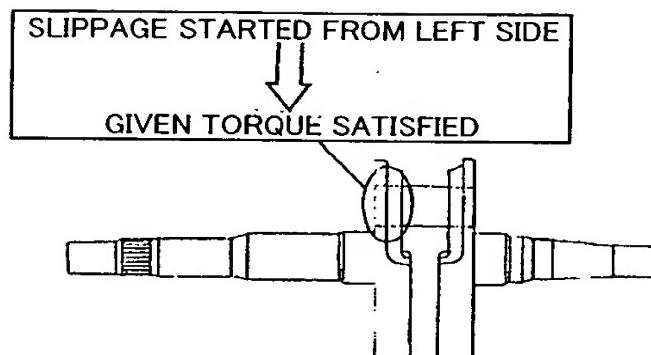


FIG. 37

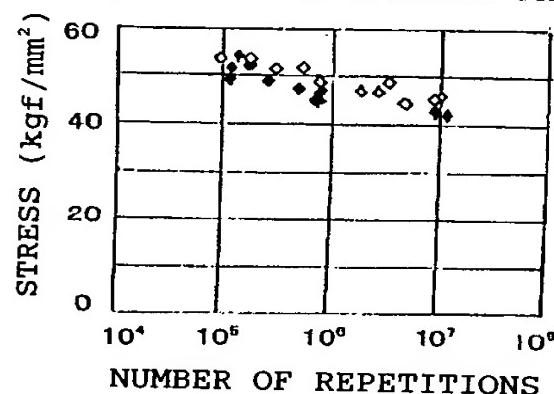


## **SLIP TORQUE**



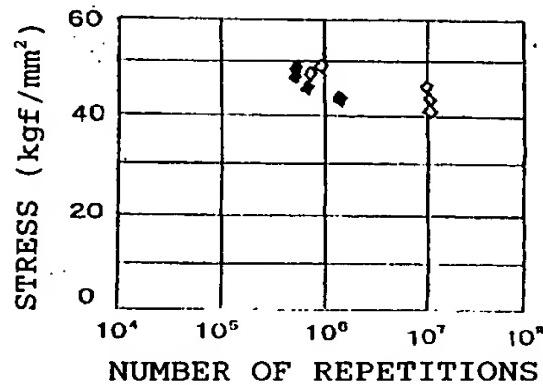
(a)

## S - N CURVE (ROTATIONAL BENDING FATIGUE TEST)



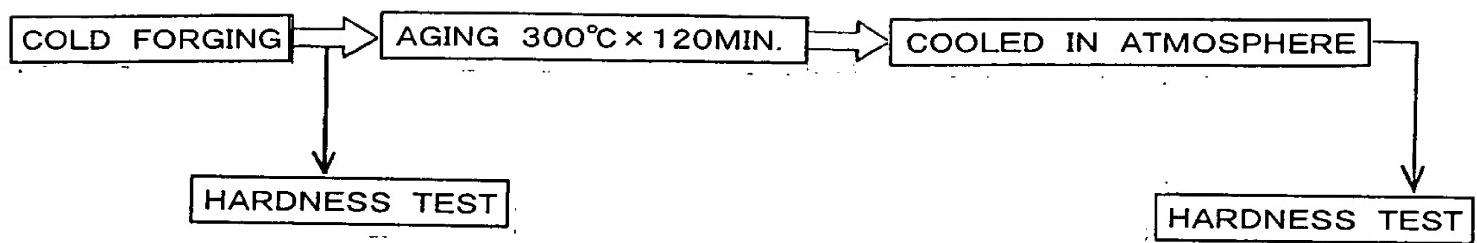
(13)

## S - N CURVE (SOLID BENDING FATIGUE TEST)

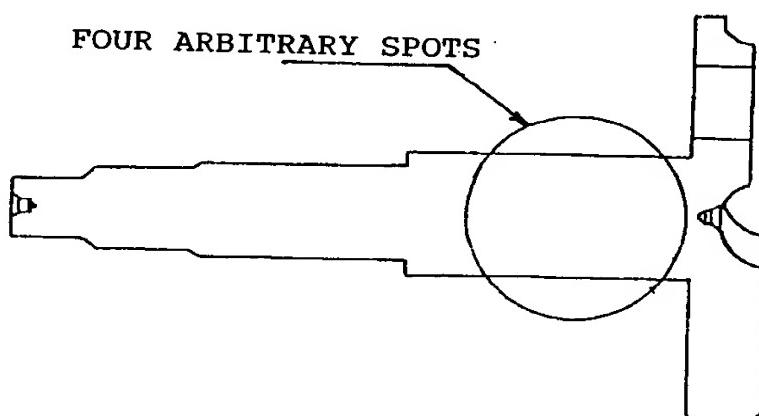


(c)

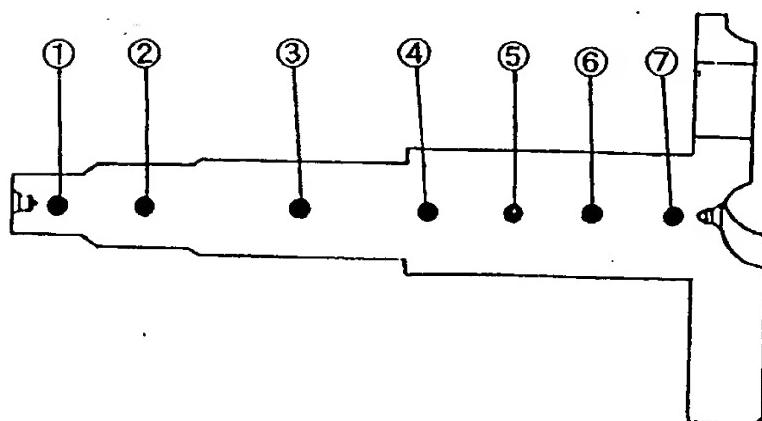
FIG. 36



(a)



(b)



(c)

FIG. 35

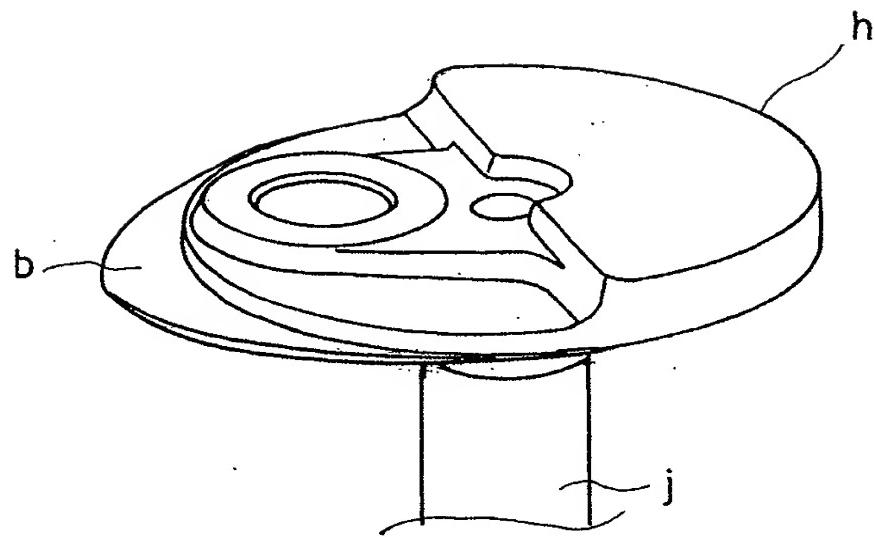
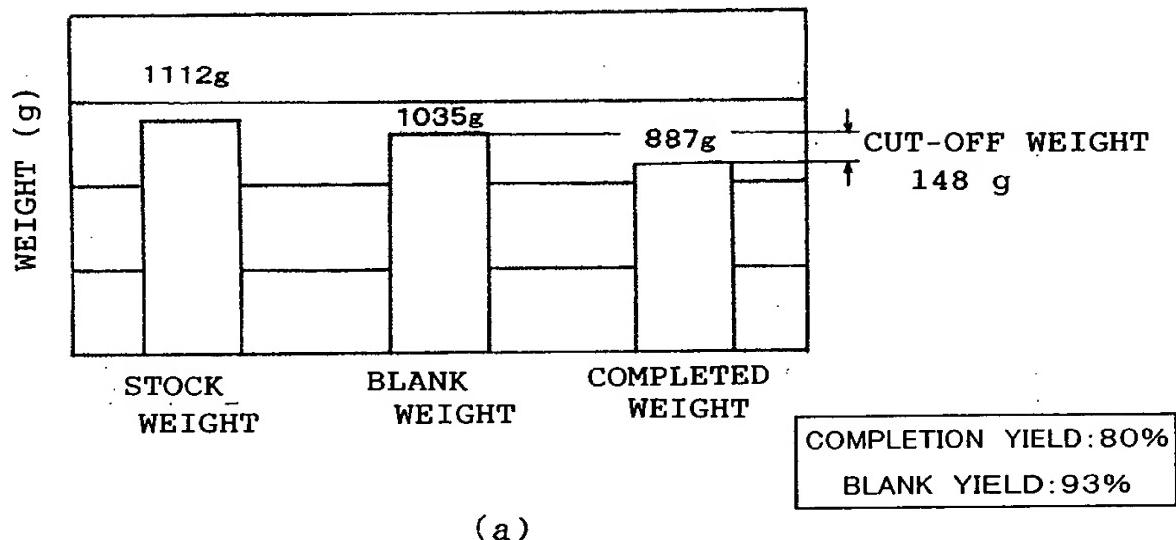


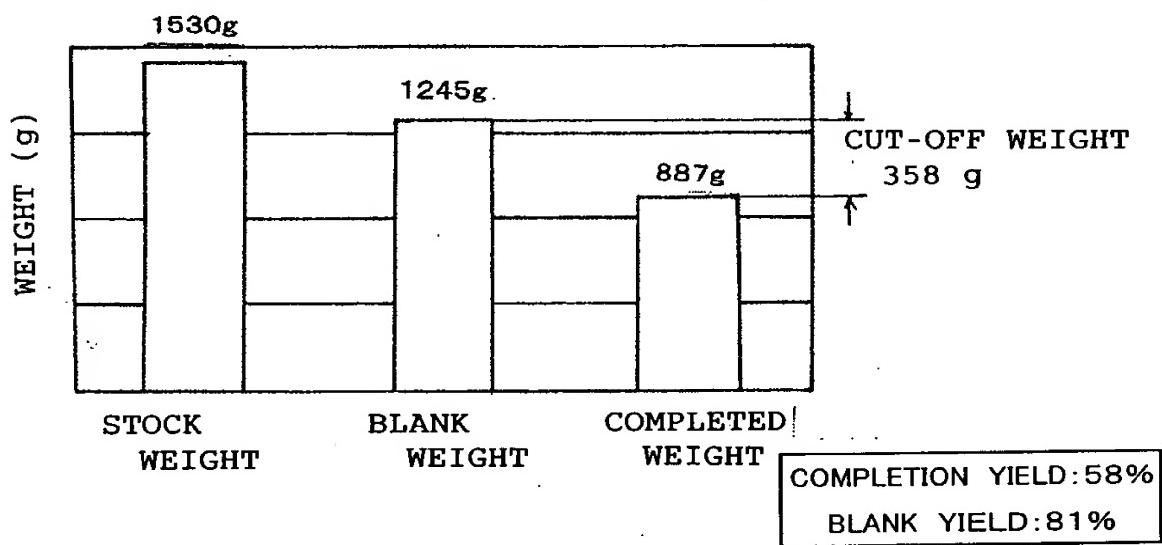


FIG. 34

(INVENTIVE COLD-FORGING METHOD)

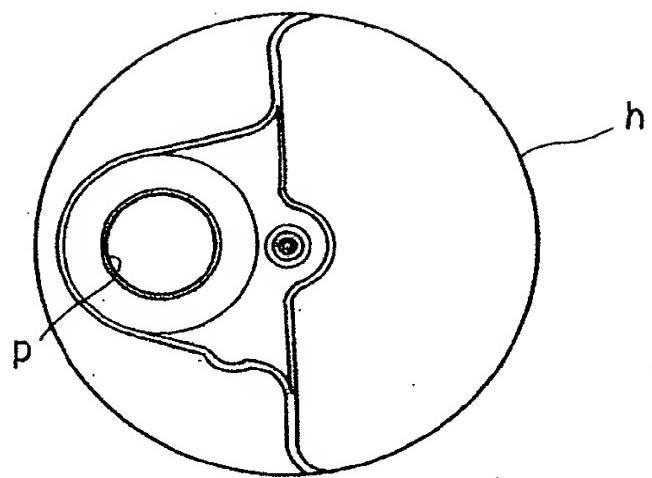


(CONVENTIONAL COLD-FORGING METHOD)

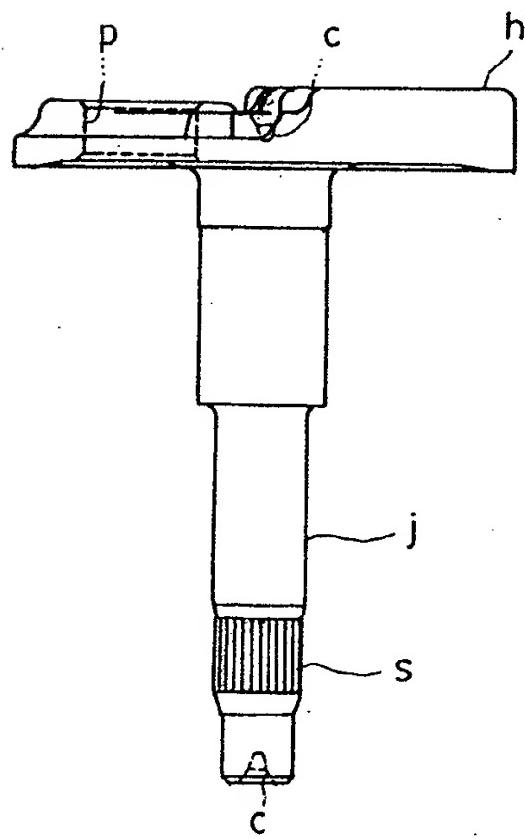


(b)

FIG. 33

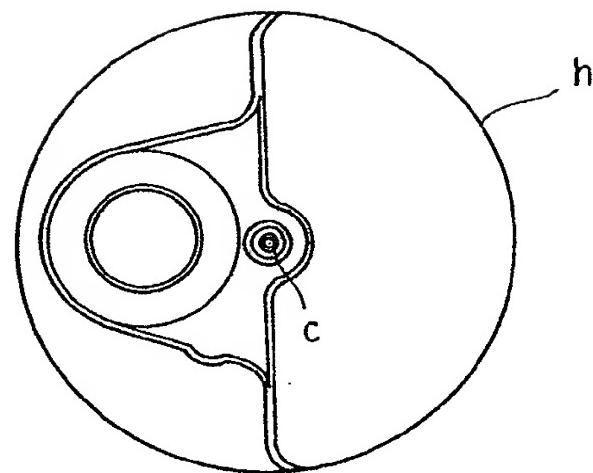


(a)

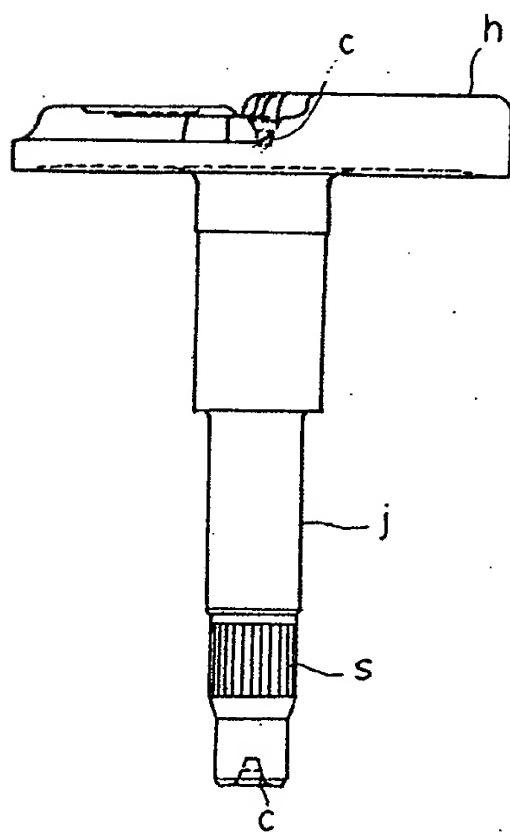


(b)

FIG. 32

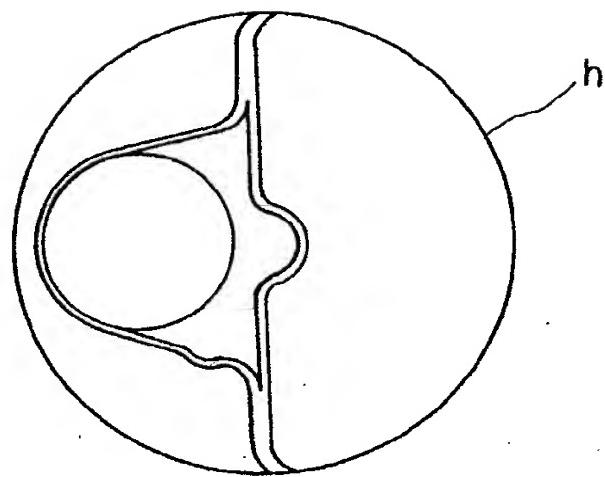


(a)

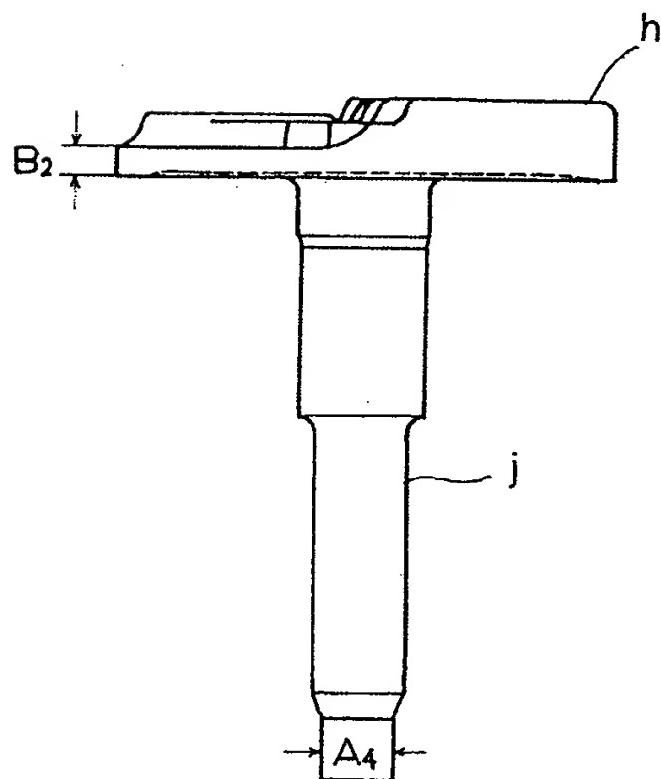


(b)

FIG. 31

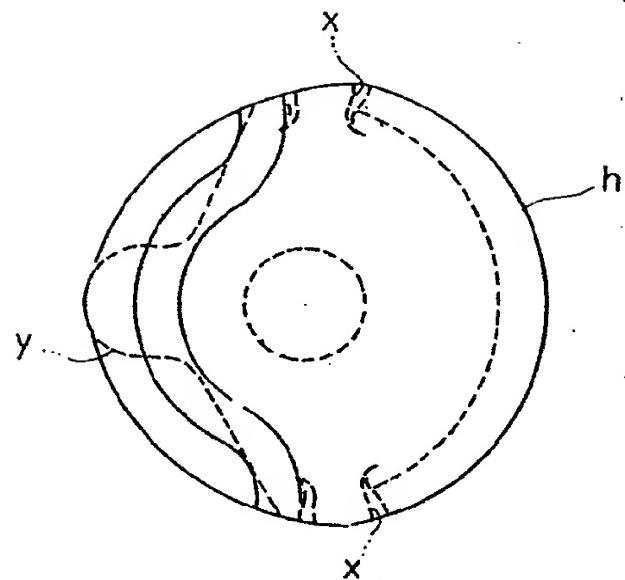


(a)

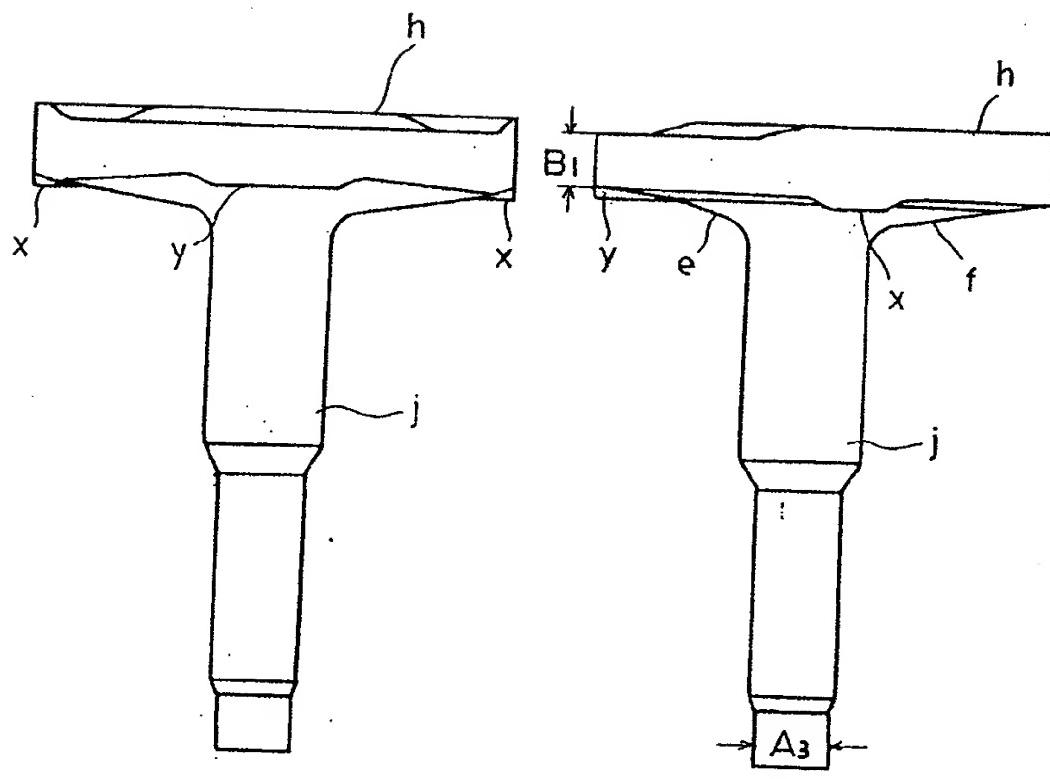


(b)

FIG. 30



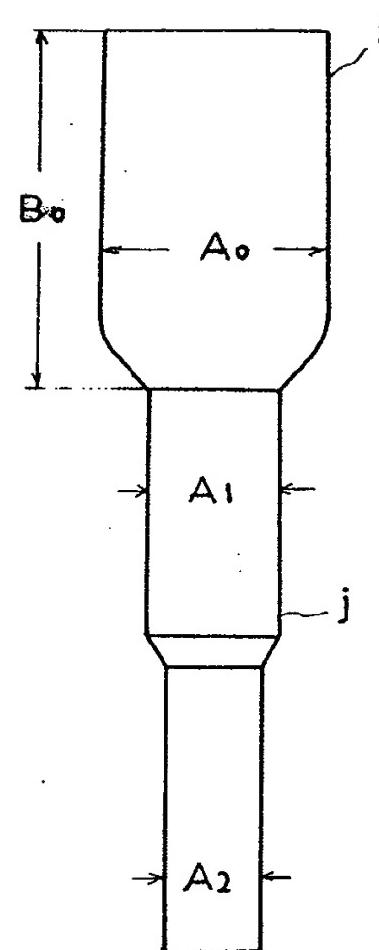
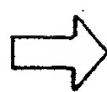
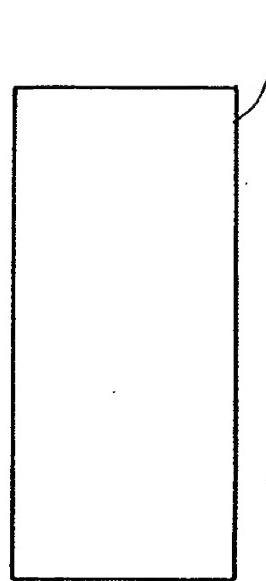
(a)



(b)

(c)

FIG. 29



(a)

(b)

FIG. 27

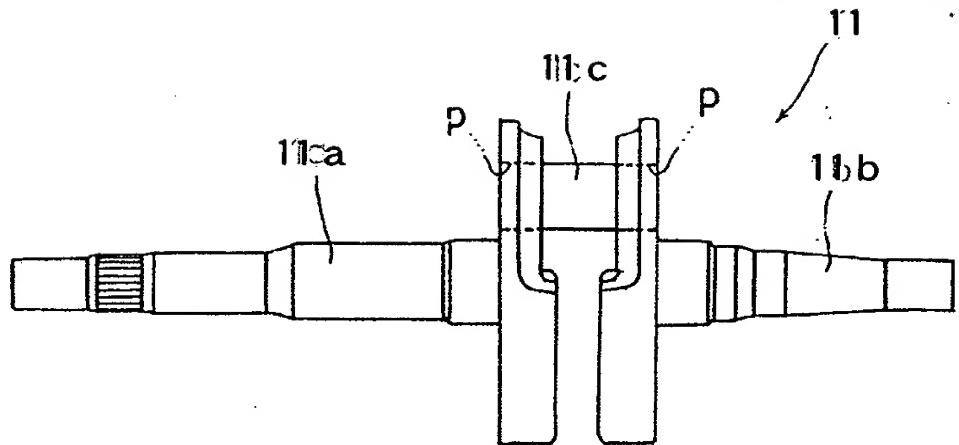


FIG. 28

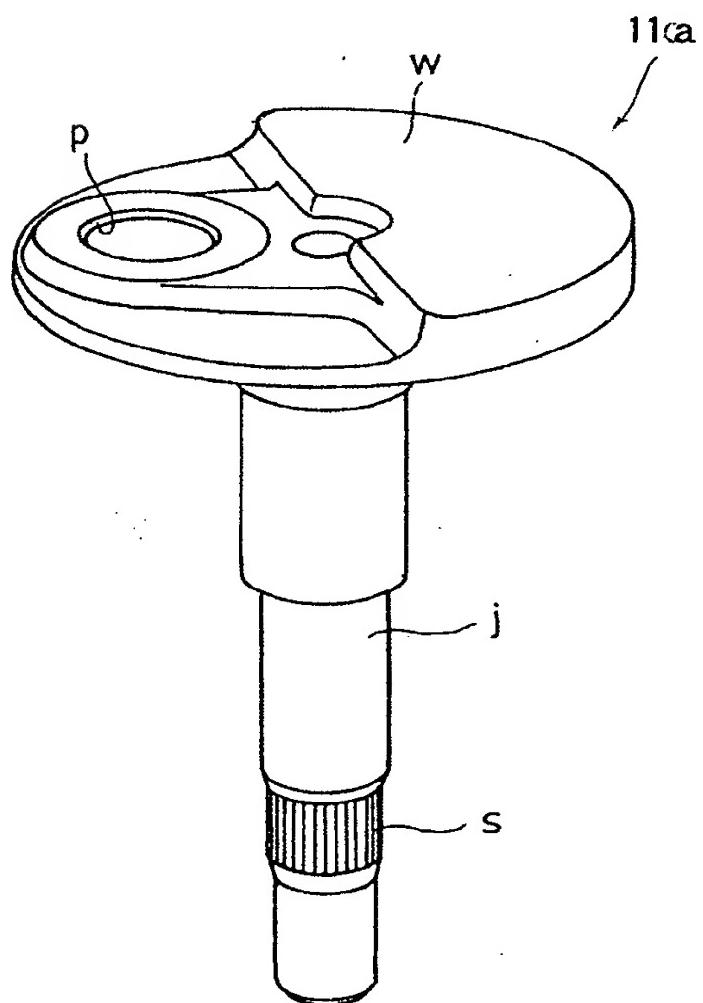


FIG. 26

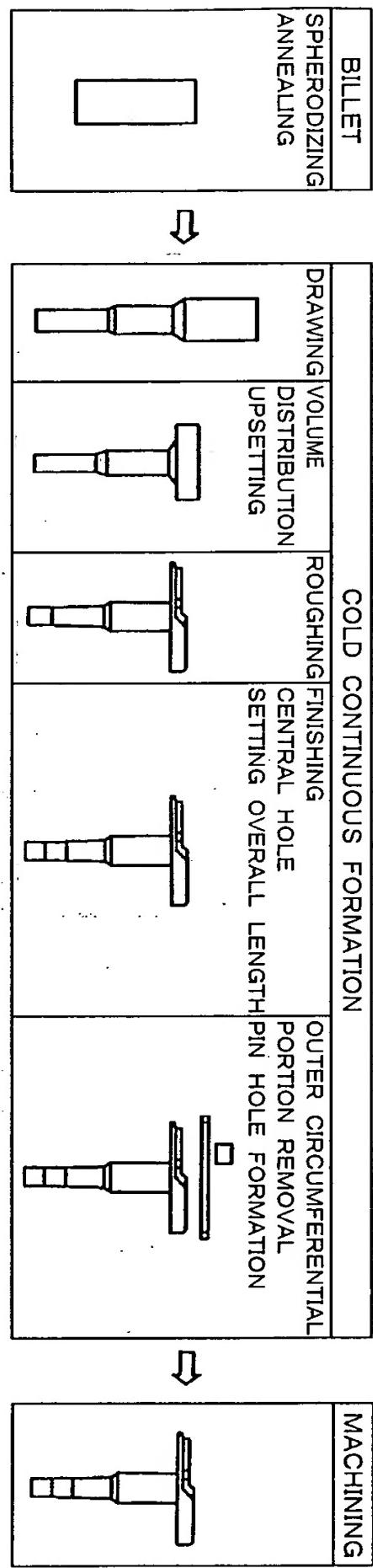


FIG. 25

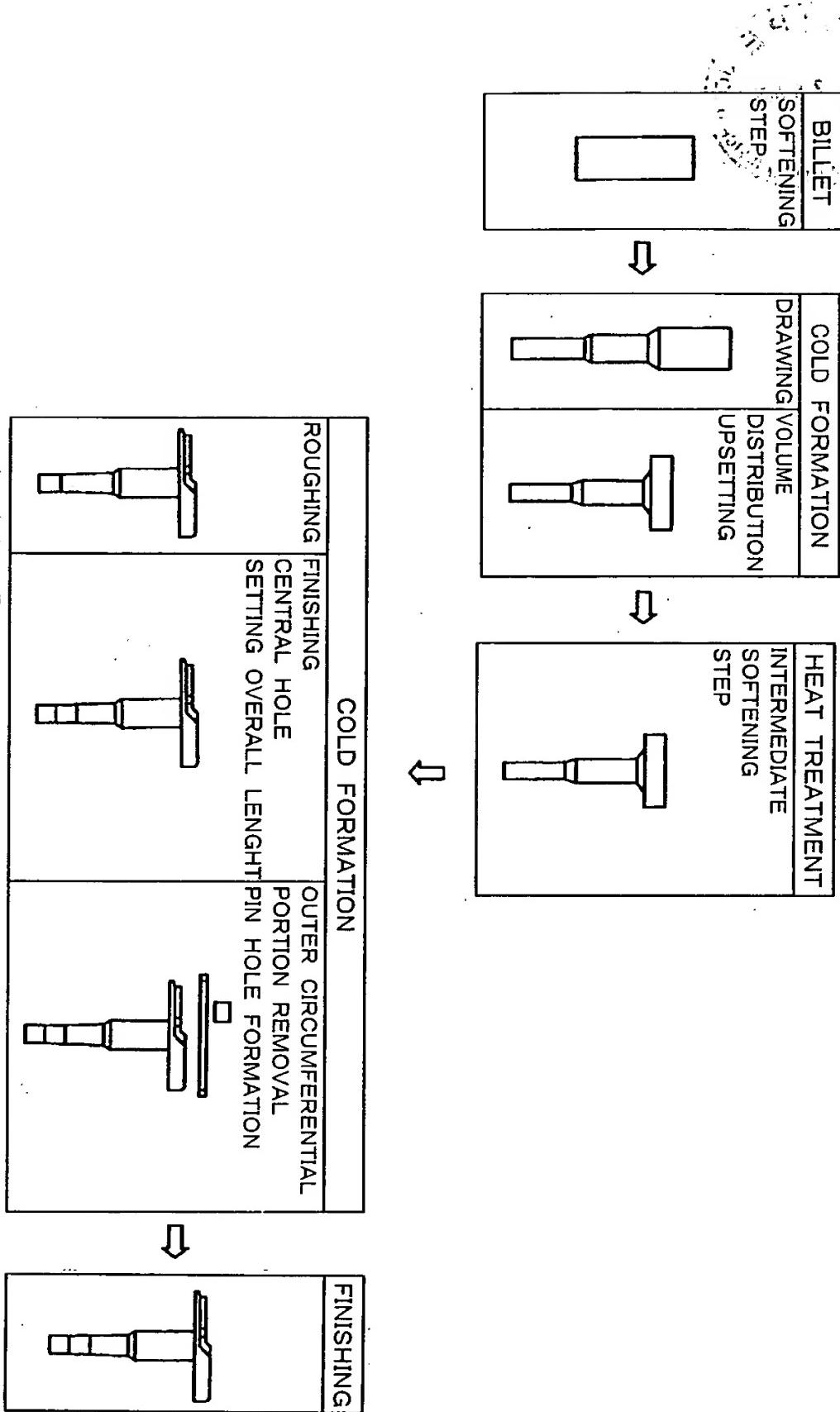


FIG. 24



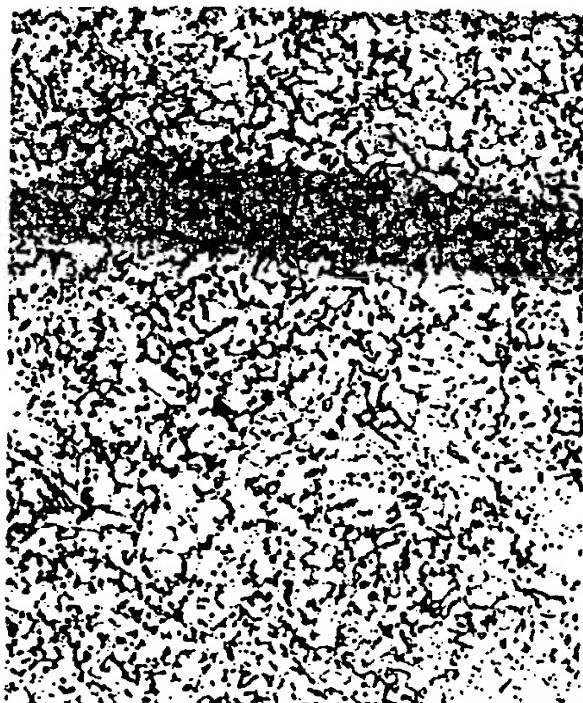
AFTER SPHERODIZING ANNEALING PATTERN 2  
1/2 R PART X 400

FIG. 22



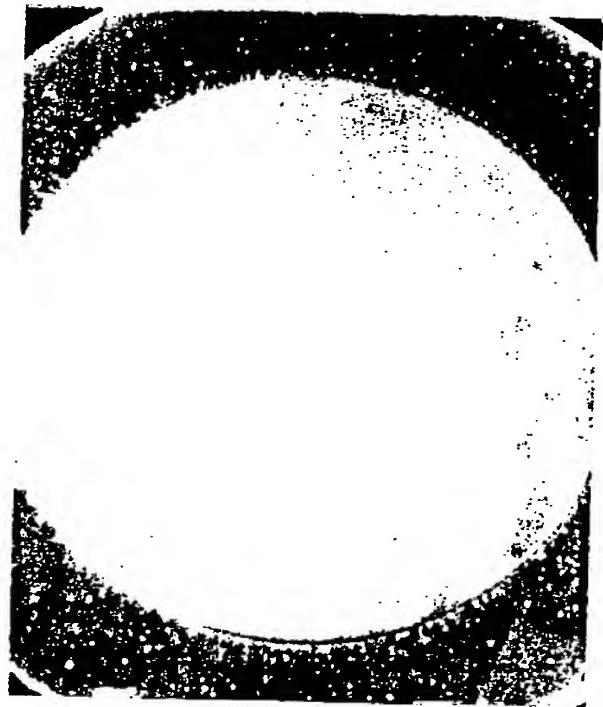
AFTER SPHERODIZING ANNEALING PATTERN 2  
SURFACE LAYER  $\times 100$

FIG. 23



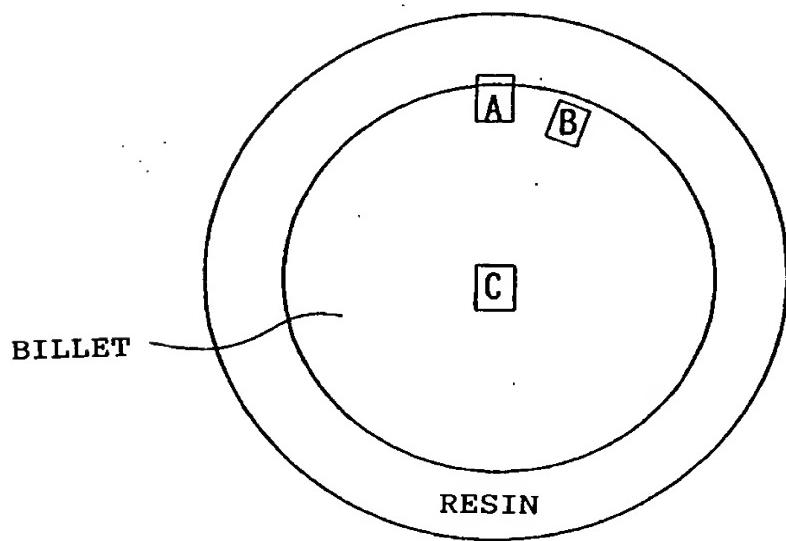
AFTER SPHERODIZING ANNEALING PATTERN 2  
SURFACE LAYER  $\times 400$

FIG. 21



MARTENSITIC MATERIAL  
AFTER SPHERODIZING ANNEALING PATTERN 2  
 $\times 2.1$

(a)



(b)

FIG. 20



AFTER SPHERODIZING ANNEALING PATTERN 1  
1/2 R PART  $\times$  400

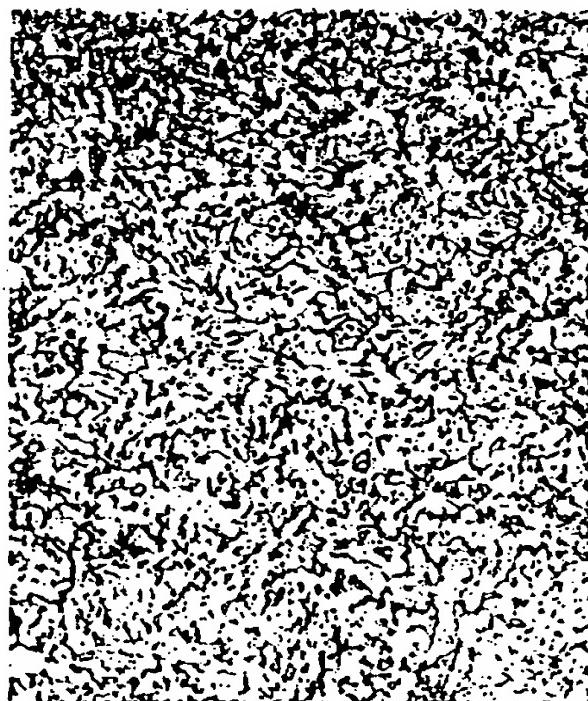
FIG. 18



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AFTER SPHERODIZING ANNEALING PATTERN 1  
SURFACE LAYER  $\times$  100

FIG. 19



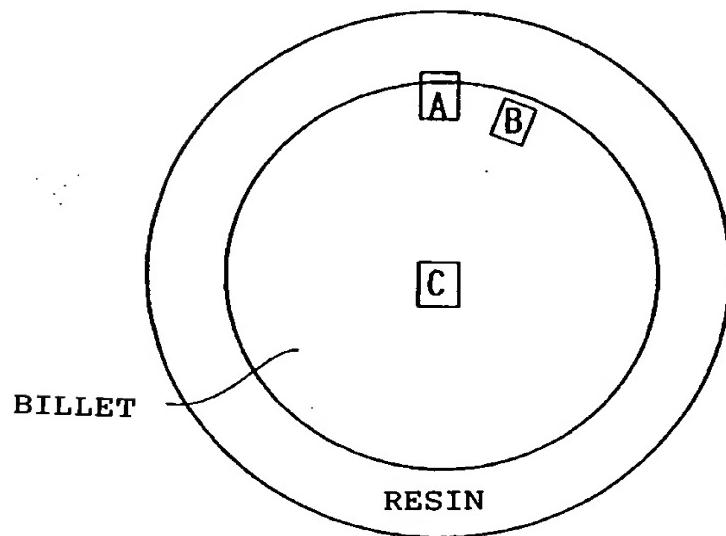
AFTER SPHERODIZING ANNEALING PATTERN 1  
SURFACE LAYER  $\times$  400

FIG. 17



MARTENSITIC MATERIAL  
AFTER SPHERODIZING ANNEALING PATTERN 1  
 $\times 2.1$

(a)



(b)

FIG. 15



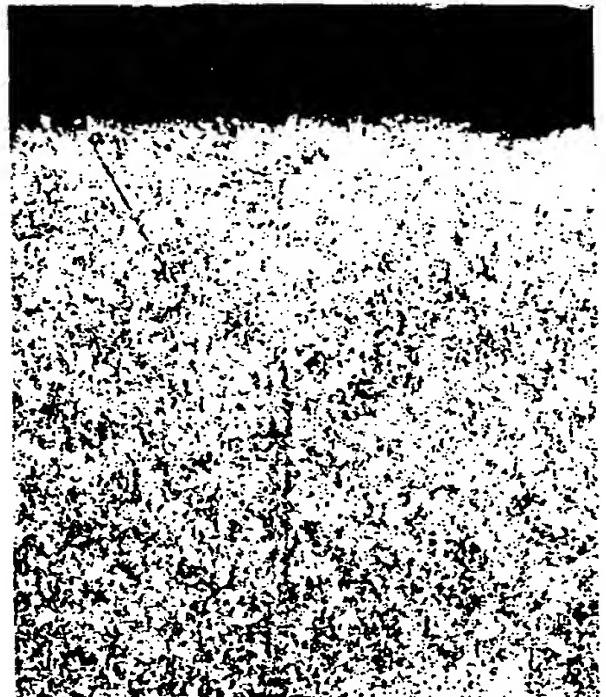
PRIOR TO SPHERODIZING ANNEALING  
1/2 R PART  $\times$  400

FIG. 16



PRIOR TO SPHERODIZING ANNEALING  
CENTRAL PART  $\times$  400

FIG. 13



PRIOR TO SPHERODIZING ANNEALING  
SURFACE LAYER  $\times 100$

FIG. 14

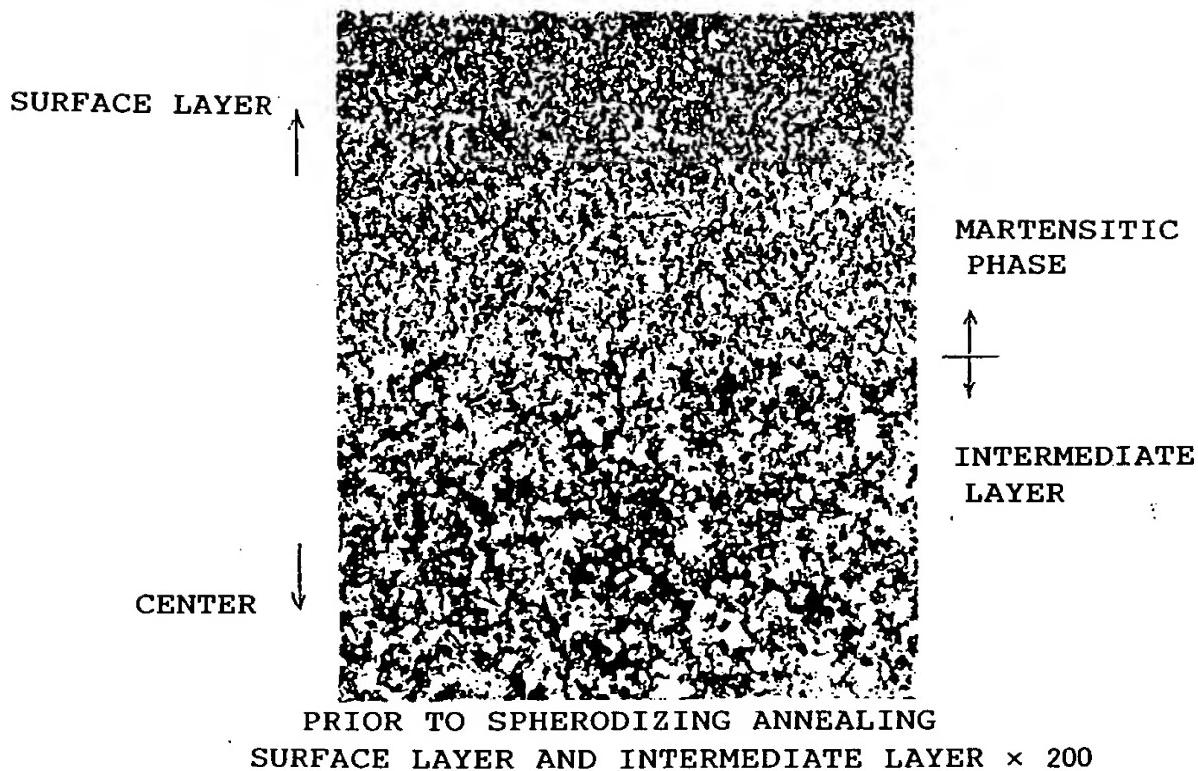
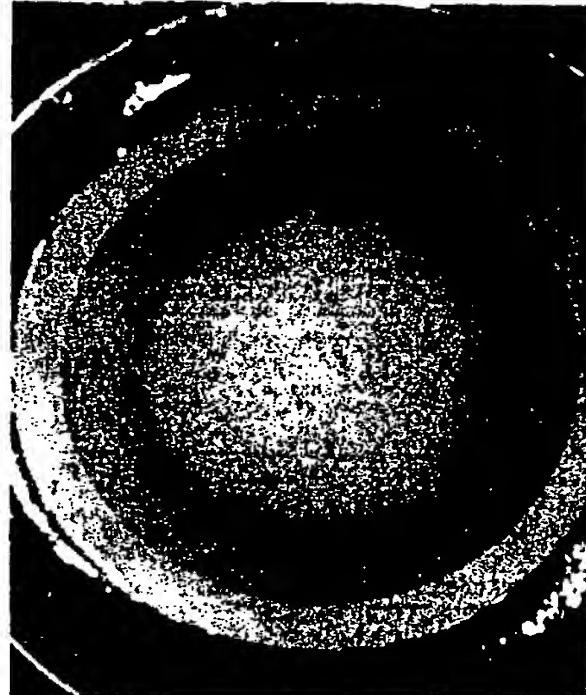
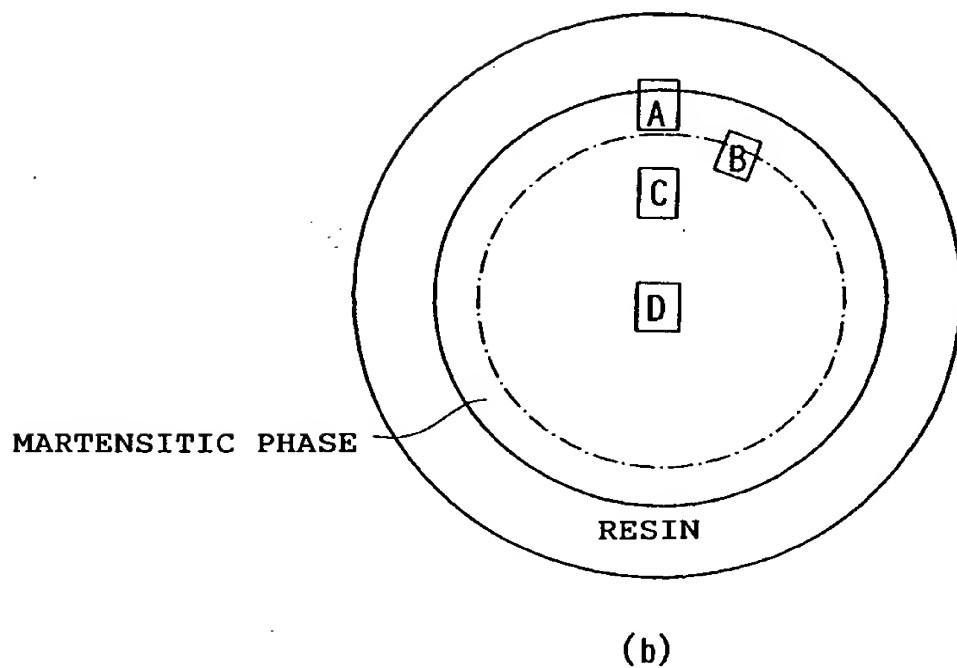


FIG. 12



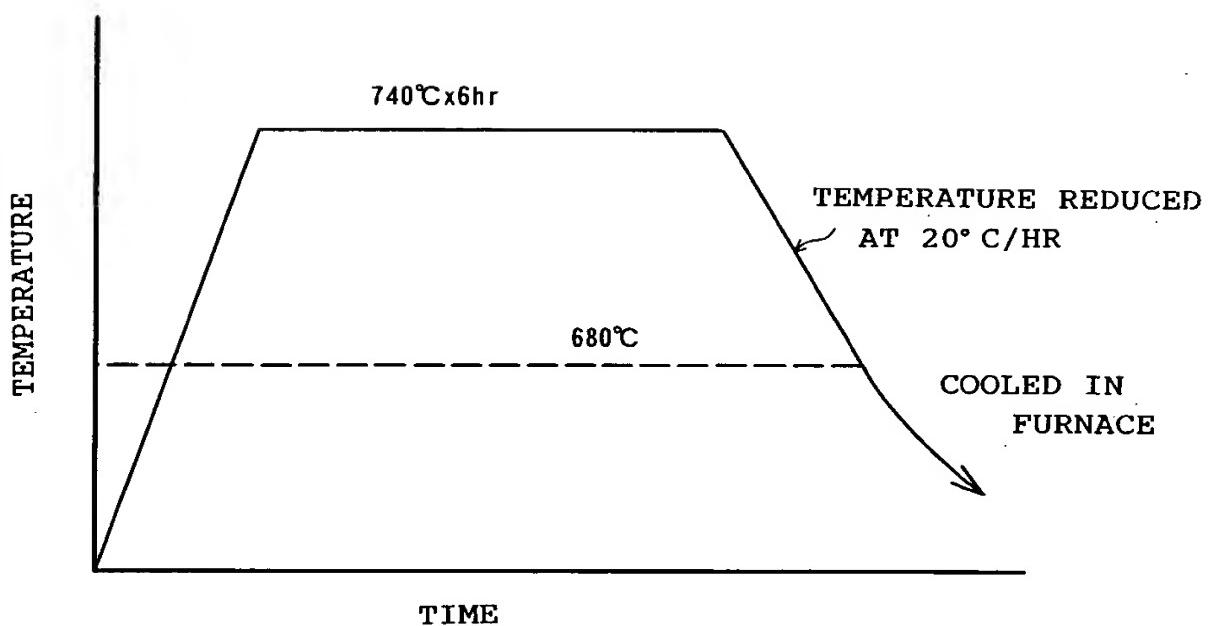
MARTENSITIC MATERIAL  
(a) PRIOR TO SPHERODIZING ANNEALING  
 $\times 2.1$



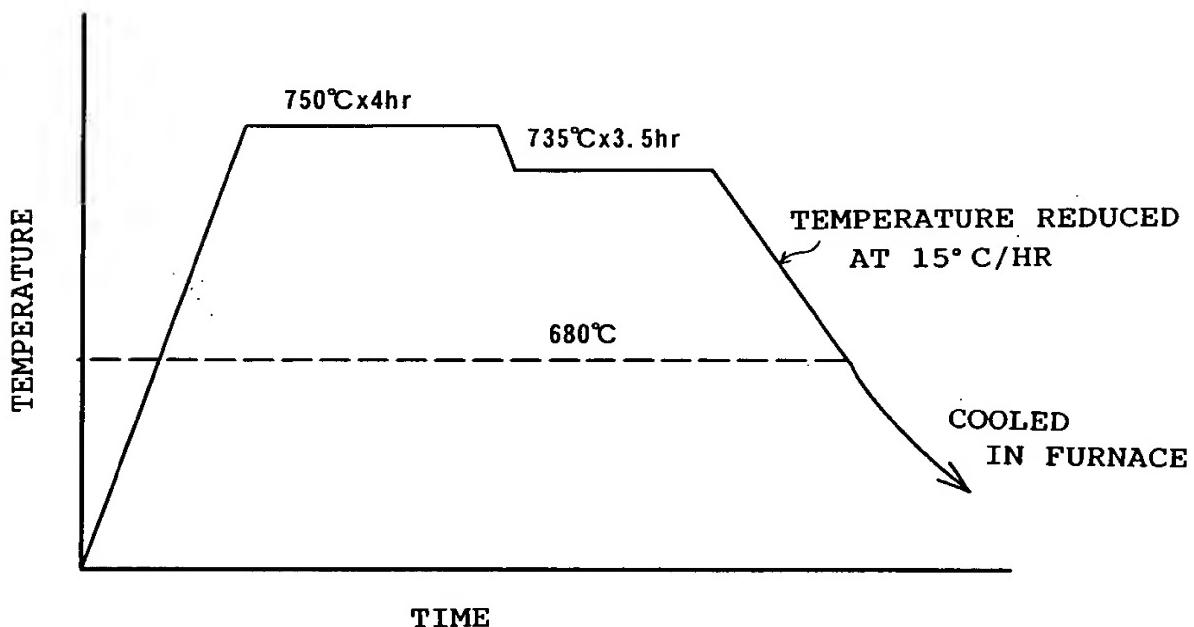
(b)

FIG. 11

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1985 6 3 83



(a)



(b)

FIG. 10

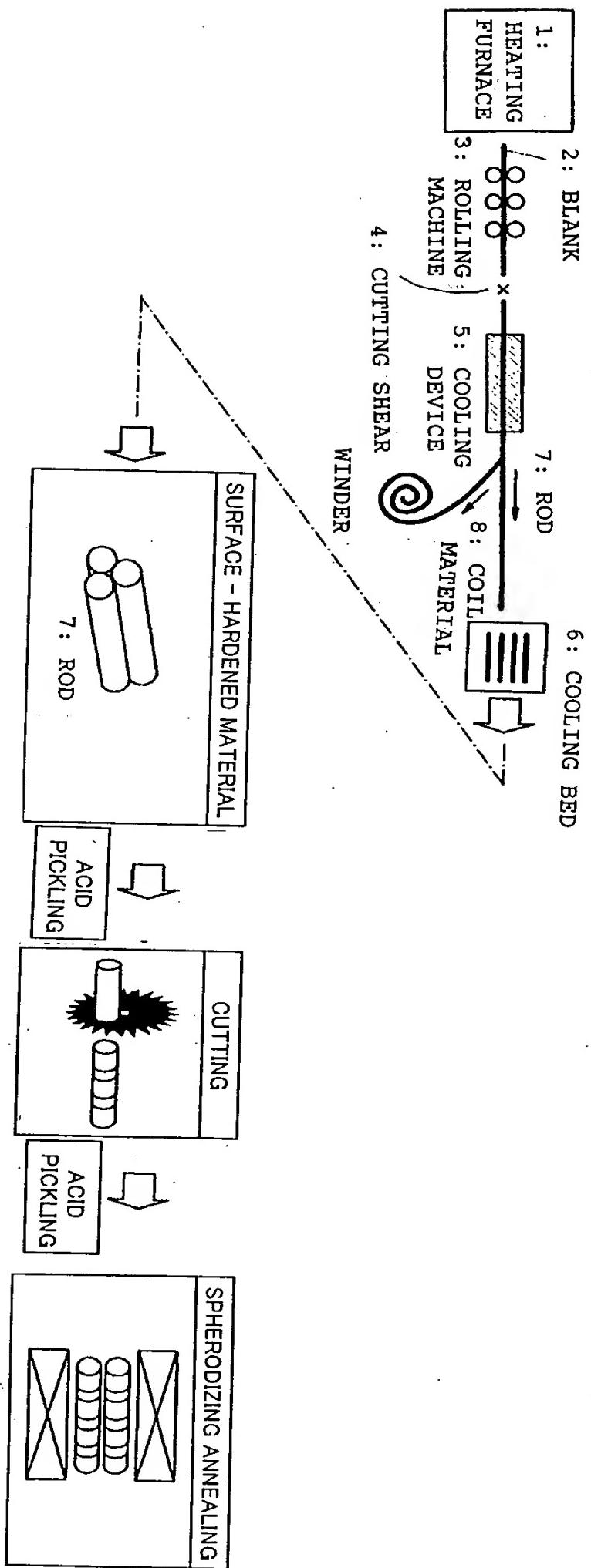


FIG. 9

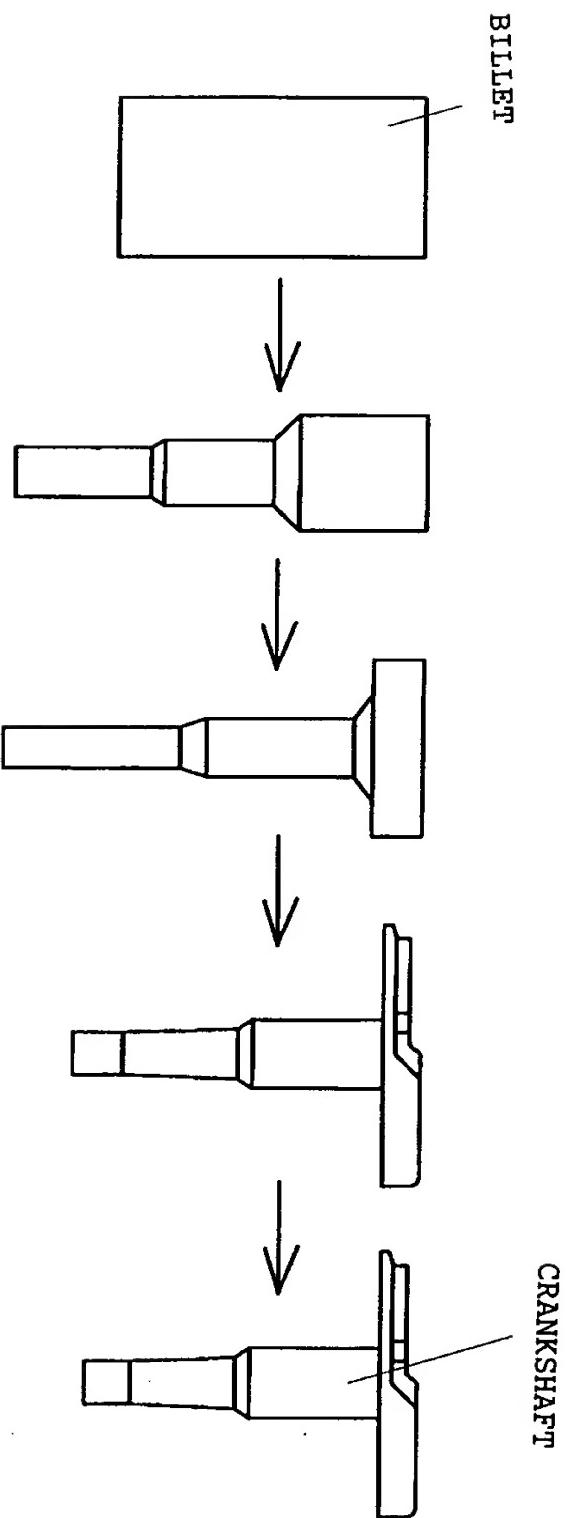


FIG. 8

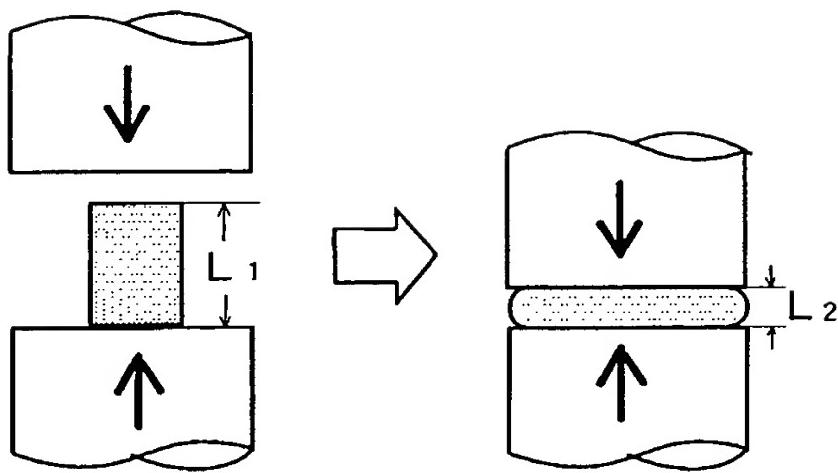
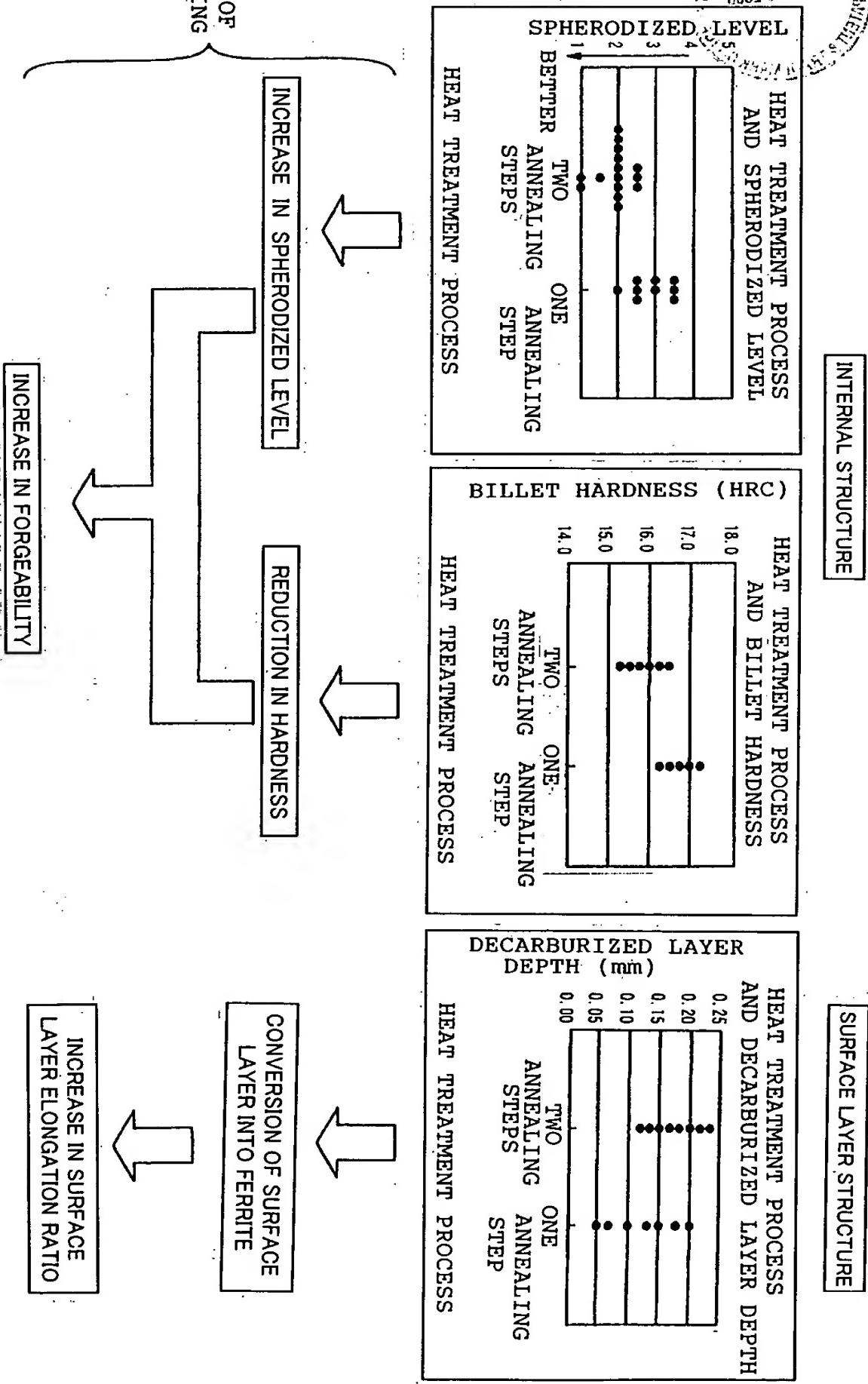


FIG. 7



**FIG. 6**

**(A) MATERIAL 1**

**ASPECT RATIO = 506 %**



**(B) MATERIAL 2**

**ASPECT RATIO = 347 %**



**(C) MATERIAL 3**

**ASPECT RATIO = 300 %**



FIG. 5



(a)

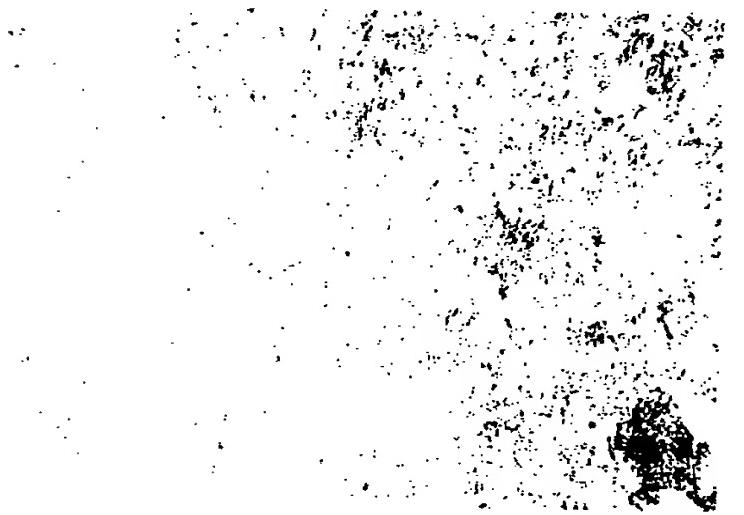


(b)

FIG. 4

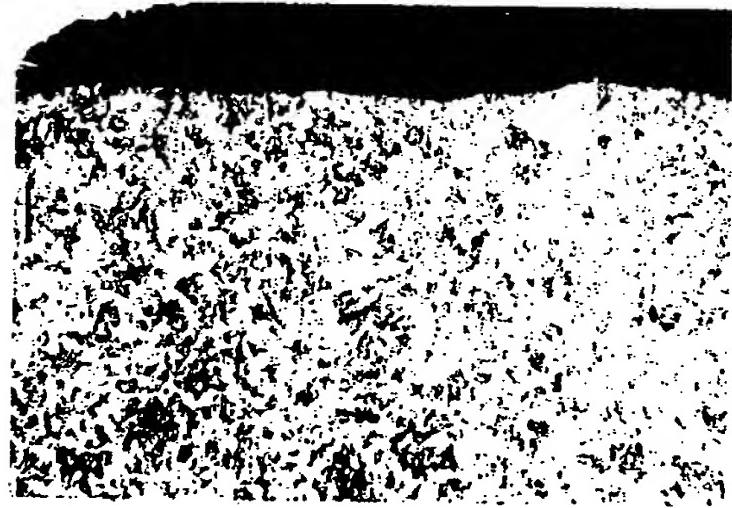


(a)

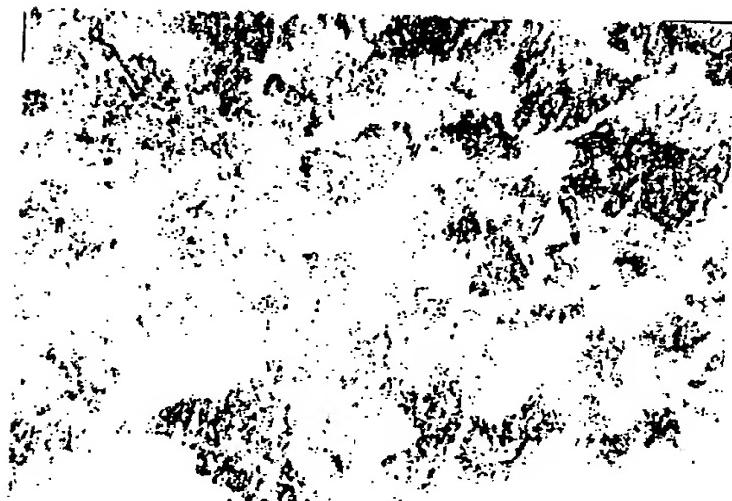


(b)

FIG. 3



(a)



(b)

FIG. 2

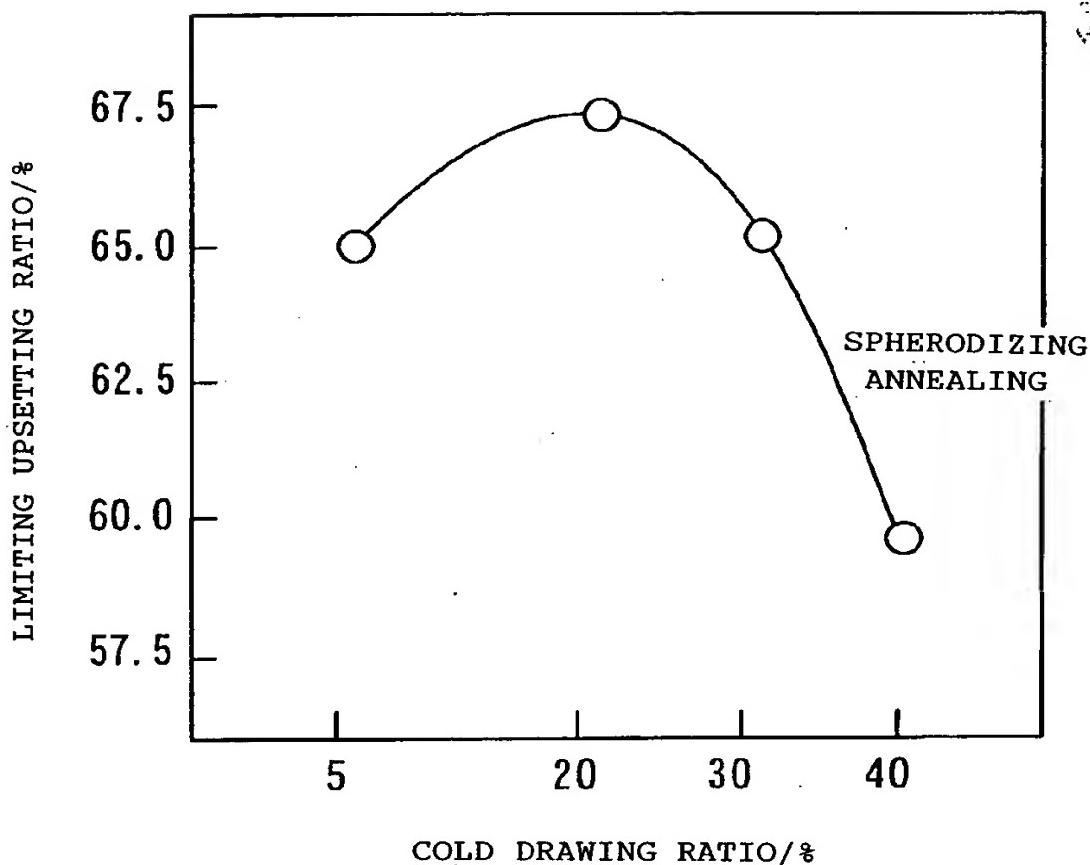


FIG. 1

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